AGRICULTURE ENGINEERING PAPER 1 (MAY)
MAGDALINE COACHING CENTRE (mc²)

1. Provision to mitigate the disadvantages of the 'tail-end farmer' of a canal outlet is provided in the water delivery pattern under…….
   a) Warabandi system
   b) Block system
   c) Shejapali system
   d) Localized system

2. The diameter of the intake pipe of a lift scheme flowing partially full is computed using …….
   a) Darcy Weisbach formula
   b) William Hazen formula
   c) Manning's formula
   d) Chezy's formula

3. The depth of flow over a sharp crested rectangular weir should not be more than about …….
   a) half the crest width
   b) two-thirds of the crest width
   c) three-fourth of the crest width
   d) the width of the weir

4. The appropriate device for the measurement of flow in irrigation furrows is …….
   a) V-notch weir
   b) Dethridge meter
   c) Portable Parshall flume
   d) Submerged orifice

5. In the improvement of an outlet command area, the important activities include …….
   a) location of canal outlet at the most appropriate point
   b) alignment of the water course along the ridge line or as close to it as possible
   c) taking branch water courses to reach isolated field plots
   d) rectangulation of land holdings, subject to topographic limitations and consent of beneficiary farmers

6. The most appropriate mechanically operated equipment for medium scale land grading and smoothing is ……...
   a) terrace blade
   b) land plane
   c) two-wheeled automatic leveler
   d) carrier-type scraper

7. The most desirable soil structure is ……..
   a) granular structure
   b) single grain structure
   c) massive structure
   d) compound structure

8. The most important factor influencing the evapotranspiration of a crop is …….
   a) physiology of the crop
   b) stage of growth of the crop
   c) degree of crop cover
   d) location from where the data are obtained

9. The minimum land slope required in land irrigated with surface methods of water application is ……..
   a) 0.01%
   b) 0.05%
   c) 0.10%
   d) 0.15%

10. In sub-irrigation water reaches the plant roots through ……
    a) deep percolation
    b) lateral spread of water from open ditches
    c) capillary action
    d) subsurface flow

11. ……. Is due to surface tension. Surface tension …….. as the soil moisture increases.
    a) cohesion, increases
    b) adhesion, increases
    c) cohesion, decreases
    d) adhesion, decreases

12. Soil excluder is provided ……
    a) in the canal downstream side of the head regulator
    b) in the river on the downstream side of barrage
    c) in the river faraway from weir on the downstream side
    d) in the river adjacent to the head regulator

13. The …… is a vertical section through soil mass.
    a) Soil horizon
    b) Soil profile
    c) Both above
    d) None of above

14. The available moisture represents the difference between the field capacity and the ……
    a) soil moisture
    b) water applied
    c) PWP
    d) none of above

15. The soil moisture at field capacity varies from soil to soil but it generally ranges from …… atmosphere.
    a) 1/10 to 1/3
    b) 1/3 to 15
    c) 15 to 31
    d) 31 to 10,000

16. ……. Is the actual area irrigated in a year form an outlet?
    a) Culturable command area (C.C.A)
    b) Gross command area (G.C.A)
    c) Intensity of irrigation
    d) All above

17. …….. is the vertical distance between the advance and recession curves at the given point.
    a) time of ponding
    b) depth of flow
    c) advance distance
    d) none of these

18. It is desirable to install the weir at a point where ……..
    a) channel bed is straight on upstream and downstream site
    b) there is drop in the elevation of channel bed on the upstream side
    c) there is drop in the elevation of the channel bed on the downstream side
    d) none of above

19. Water saving to the tune of ……. Percent is possible in drip irrigation system.
    a) 30 to 70
    b) 20 to 40

c) 10 to 30
d) 80 to 90

20. …….. is also called as media filter.
a) screen
b) sand
c) disc
d) cyclone

21. In case of hilly terrain the lateral should be laid ……..
a) along the slope
b) along the contour
c) across the contour
d) along the grade

22. Chemical clogging in drip system can be avoided by ……. treatment.
a) acid treatment
b) chlorine treatment
c) filtration
d) hypo chloride treatment

23. Under normal working conditions, the maximum emission rate of drippers ……..
a) 5 liters/hr
b) 10 liters/hr
c) 15 liters/hr
d) 20 liters/hr

24. The irrigation efficiency of sprinklers depends upon the ……. of water application.
a) degree of uniformity
b) quality
c) size
d) quantity

25. Sprinkler system is designed for ……. of consumptive use of crops irrigated by it.
a) daily peak rate
b) minimum rate
c) average rate
d) maximum rate

26. In case of sprinkler system, when the precipitation rate is less than ……. mm/hr, it is called low volume sprinkler.
a) 15
b) 25
c) 13
d) 18

27. In a sprinkler irrigation system the most commonly used pipe for a permanently laid main line is …….
a) asbestos cement pipe
b) aluminium pipe
c) steel pipe
d) PVC pipe

28. The major factor influencing the efficiency of a well-designed sprinkler irrigation system is …….
a) operating pressure
b) wind velocity
c) sprinkler spacing
d) diameter of sprinkler lateral

29. An aquifer is a geologic formation that …….
a) contain water but does not transmit
b) does not contain water
c) contain water and also transmit
d) is a rock outcrop

30. The major source of ground water replenishment is ……..
a) seepage from water bodies
b) precipitation
c) deep percolation from irrigated fields

d) artificial ground water recharge

31. The near surface zone where all pores are filled with water is called ……..
    a) the vadose zone
    b) the saturated zone
    c) the water table
    d) the aquifer

32. …….. factors most affect the piezometric surface for artesian aquifer.
    a) slope
    b) shape
    c) volume
    d) pressure

33. The quantity of water that a unit volume of aquifer will yield when drained by gravity is called ……...
    a) specific storage
    b) specific capacity
    c) specific release
    d) specific yield

34. Specific yield is the property of ……..
    a) confined aquifer
    b) unconfined aquifer
    c) leaky-confined aquifer
    d) artesian aquifer

35. A cavity well is tube well which has …….
    a) a strainer
    b) no strainer
    c) slotted pipe and gravel pack
    d) a brass screen

36. In a fully penetrating well in confined aquifer depth of the observation well should be up to …….
    a) top of the well screen
    b) centre of the well screen
    c) bottom 2/3rd of the well screen
    d) bottom of the well screen

37. Piezometer measure the pressure head in soil profiles which are …….
    a) saturated
    b) unsaturated
    c) both
    d) none of these

38. Which of the following geologic materials would make the best aquifer?
    a) well-sorted gravel
    b) poorly-sorted gravel
    c) poorly-sorted sands
    d) well-sorted sands

39. In reverse rotary drilling, the desirable velocity of water inside the drill pipe to lift fine cuttings is about …….
    a) 40 m/sec
    b) 60 m/sec
    c) 80 m/sec
    d) 100 m/sec

40. For optimum performance, the per cent submergence of an air lift pump is …….
    a) 50%
    b) 60%
    c) 70%
    d) 80%

41. In unconsolidated formation the cross-section open well is generally …….
    a) rectangular
    b) circular
    c) triangular
    d) both rectangular and circular

42. Gravel packing is required in an aquifer with uniform coefficient ……..
    a) Less than 2
    b) Between 3 and 4
    c) Between 5 and 6
    d) More than 6

43. The minimum distance of the tube well from garbage should be ……
    a) 25 m
    b) 50 m
    c) 75 m
    d) 100 m

44. A dispersed clay soil has ……
    a) High infiltration
    b) Low infiltration
    c) Good workability
    d) Good internal drainage

45. In non-saline alkali soil, the exchangeable sodium percentage is …….
    a) < 5
    b) 5-10
    c) 10-15
    d) > 15

46. Soil amendments like Gypsum are necessary for reclaiming …….. Soils.
    a) Saline
    b) Sodic
    c) Vertisols
    d) None of above

47. The difference between the saturated moisture concentration and the moisture content at a given capillary pressure is the …… for that pressure.
    a) drainable pore volume
    b) drainage
    c) both a and b
    d) none of the above

48. Cavitation is formation of cavity in flow due to …….. .
    a) Negative pressure as a result of high velocity
    b) Positive pressure as a result of high velocity
    c) Differential pressure as a result of tremendous velocity
    d) None of the above

49. Drainage removes only ……. water from the soil.
    a) Gravitational
    b) Held water
    c) Capillary
    d) Pressurized water

50. ……. is the depth in centimeters of water drained off from a given area in 24 hours?
    a) Specific storage
    b) Hydraulic conductivity
    c) Drainage coefficient
    d) Storage coefficient

51. The infiltration rate curve after a long time becomes …….
    a) Vertical
    b) Horizontal
    c) Asymptotic to time axis
    d) Asymptotic to rate axis

52. The process by which water vapour leaves the living plant body and enters the atmosphere is …….
    a) Evaporation
    b) Transpiration
    c) Evapo-transpiration
    d) None of these

53. The design rate to be used in planning irrigation system is ……
    a) Consumptive use
    b) Seasonal consumptive use
    c) Peak period consumptive use
    d) None of these

54. The ratio of crop yield(Y) to the total amount of water used in the field (WR) is known as ……..
    a) Field water use efficiency
    b) Crop water use efficiency
    c) Water application efficiency
    d) None of these

55. The most widely used evaporation pan is ……
    a) Piche evaporimeter
    b) U. S. W. B. class A pan
    c) Metallic pans
    d) None of these

56. The average annual rainfall of India is …….
    a) 100cm
    b) 110cm
    c) 119.4 cm
    d) 125cm

57. The total quantity of water that enters the soil in a given period of time is known as ……..
    a) Accumulated infiltration
    b) Infiltration rate
    c) Basic infiltration rate
    d) None of these

58. The amount of irrigation water required to bring the soil moisture level in the effective root zone to field capacity is the ……..
    a) Net irrigation requirement
    b) Gross irrigation requirement
    c) Irrigation requirement
    d) None of these

59. The soil column occupied by the root system of plants is known as …….
    a) Soil profile
    b) Soil horizons
    c) Rhizosphere
    d) Triangular

60. The total area which can be irrigated by a certain channel or project is ……..
    a) Gross command area
    b) Command area
    c) Culturable command area
    d) Actual area irrigated

61. The relation between the area irrigated, or to be irrigated and the quantity of water used or required to irrigate it for the purpose of maturity the crop is known as …….
    a) Delta
    b) Duty
    c) Delta of these
    d) None of these

62. The weirs having the crest length is less than the width of the upstream channel is known as …….
    a) Suppressed weirs
    b) Contracted weirs
    c) Rectangular weirs
    d) None of these

63. The relationship between duty & delta is ……..
    a) Δ =864 B/D
    b) Δ =860 B/D
    c) Δ =864 D/B
    d) None of above

64. ……. Is the ratio of mean supply discharge to full capacity discharge.
    a) time factor
    b) capacity factor
    c) nominal duty
    d) None of above

65. A canal head regulator is provided at the head of off taking canal, and serves the following functions …….
    a) it regulates the supply of water entering the canal
    b) it controls the entry of silt in the canal
    c) it prevents the river floods entering the canal
    d) all of above

66. Silt excluder is provided ……..
    a) in the canal downstream side of the head regulator
    b) in the river on the downstream side of barrage
    c) in the river faraway from weir on the downstream side
    d) in the river adjacent to the head regulator

67. When Froude number is F_1 = 4.5 to 9.0, the hydraulic jump is called as ……
    a) strong jump
    b) steady jump
    c) oscillating
    d) no jump

68. A……. Channels are aligned at right angles to the contours.
    a) contour canals
    b) side slope canals
    c) watershed canals
    d) none of above

69. ……. is the ratio of the rate of change of discharge of the outlet to the rate of change of discharge of the distributaries of canal.
    a) proportionality
    b) flexibility
    c) setting
    d) sensitivity

70. If most of the ponding is done by the gates and smaller part or nil part of it is done by the raised crest then this barrier is known as …….
    a) barrage
    b) weir
    c) afflux
    d) none of above

71. …… is installed to indicate the hydrostatic pressure of ground water at the lower end of the pipe.
    a) observation wells
    b) piezometers
    c) tubes wells
    d) none of above

72. In the hydrological cycle, the average residence time of water in the global
    a) atmospheric moisture is larger than that in the global rivers
    b) oceans is smaller than that of the global groundwater
    c) rivers is larger than that of the global groundwater
    d) oceans is larger than that of the global groundwater

73. The standard Symons' type rainguage has a collecting area of diameter

a) 12.7 cm
b) 10 cm
c) 5.08 cm
d) 25.4 cm

74. The double-mass curve technique is adopted to
a) check the consistency of raingauge records
b) to find the average rainfall over a number of years
c) to find the number of rainguages required
d) to estimate the missing rainfall data

75. The Thiessen polygon is
a) a polygon obtained by joining adjoining rainguage stations
b) a representative area used for weighing the observed station precipitation
c) an area used in the construction of depth-area curves
d) the descriptive term for the shape of a hydrograph

76. Depth-area-duration curves of precipitation at a station would normally be
a) curves, concave upwards, with duration increasing outward
b) curves, concave downwards, with duration increasing outward
c) curves, concave upwards, with duration decreasing outward
d) curves, concave downwards, with duration decreasing outward

77. If e_w and e_a are the saturated vapour pressures of the water surface and air respectively, the Dalton's law for evaporation E_L in unit time is given by E_L =
a) $(e_w - e_a)$
b) $K e_w e_a$
c) $\boldsymbol{K(e_w - e_a)}$
d) $K(e_w + e_a)$

78. The *ISI* standard pan evaporimeter is the
a) same as the *US* class a pan
b) has an average pan coefficient value of 0.60
c) has less evaporation than a *US* class A pan
d) has more evaporation than a *US* class A pan

79. The chemical that is found to be most suitable as water evaporation inhibitor is
a) ethyl alcohol
b) methyl alcohol
c) cetyl alcohol
d) butyl alcohol

80. Interception losses
a) include evaporation, through flow and stemflow
b) consists of only evaporation loss
c) includes evaporation and transpiration losses
d) consists of only stemflow

81. The science and practice of water flow measurement is known as
a) hypsometry
b) hydro-meteorology
c) fluvimetry
d) hydrometry

82. The surface velocity at any vertical section of a stream is
a) not of any use in stream flow measurement

b) smaller than the mean velocity in that vertical
c) larger than the mean velocity in that vertical section
d) equal to the velocity in that vertical at 0.6 times the depth

83. The dilution method of stream gauging is ideally suited for measuring discharges in
a) a large alluvial river
b) flood flow in a mountain stream
c) steady flow in a small turbulent stream
d) a stretch of a river having heavy industrial pollution loads

84. The slope- area method is extensively used in
a) development of rating curve
b) estimation of flood discharge based on high-water marks
c) cases where shifting control exists
d) cases where backwater effect is present

85. Direct runoff is made up of
a) surface runoff, prompt interflow and channel precipitation
b) surface runoff, infiltration and evapotranspiration
c) overland flow and infiltration
d) rainfall and evaporation

86. An intermittent stream
a) has water table above the stream bed throughout the year
b) has only flash flows in response to storms
c) has flows in the stream during wet season due to contribution of groundwater
d) does not have any contribution of ground water at any time

87. In a flow-mass curve study, the demand line drawn from a ridge in the curve did not interest the mass curve again. This represents that
a) the reservoir was not full at the beginning
b) the storage was not adequate
c) the demand cannot be met by the inflow as the reservoir will not refill
d) the reservoir is wasting water by spill

88. An area is classified as a drought prone area if the probability p of occurrence of a drought is
a) $0.4 < P \leq 1.0$
b) $0.2 \leq P \leq 0.40$
c) $0.1 \leq P < 0.20$
d) $0.0 < P < 0.20$

89. The shape of the recession limb of a hydrograph depends on
a) basin as well as storm characteristics
b) storm characteristics only
c) basin characteristics only
d) base flow only

90. A unit hydrograph has one unit of
a) peak discharge
b) rainfall duration
c) direct runoff
d) the time base of direct runoff.

91. An *IUH* is a direct runoff hydrograph of

a) of one cm magnitude due to rainfall excess of 1-h duration
b) that occurs instantaneously due to a rainfall excess of 1-h duration
c) of unit rainfall excess precipitating instantaneously over the catchment
d) occurring at any instant in long duration

92. A culvert is designed for a peak flow Q_p on the rational formula. If a storm of the same intensity as used in the design but of duration twice larger occurs the resulting peak discharge will be
a) Q_P
b) 2 Q_P
c) $Q_P/2$
d) Q^2_P

93. For an annual flood series arranged in decreasing order of magnitude, the return period for a magnitude listed at position *m* in a total of *N* entries, by Weibull formula is
a) m/N
b) m/(N+1)
c) (N+1)/m
d) N/ (m+1).

94. The probability of a flood equal to or greater than 50 year flood, occurring at least one in next 50 years is
a) 0.02
b) 0.636
c) 0.364
d) 1.0

95. The term mean annual flood denotes
a) mean floods in partial-duration series
b) mean of annual flood flow series
c) a flood with a recurrence interval of 2.33 years
d) a flood with a recurrence interval of N/2 years, where N=number of years of record

96. The standard project flood is
a) Smaller than probable maximum flood in the region
b) The same as the design flood used for all small hydraulic structures
c) Larger than the probable maximum flood by a factor implying factor of safety
d) The same as the probable maximum flood

97. The hydraulic methods of flood - routing use
a) equation of continuity only
b) both the equation of motion and equation of continuity
c) energy equation only
d) equation of motion only

98. The wedge storage in a river reach during the passage of a flood wave is
a) a constant
b) negative during rising phase
c) positive during rising phase
d) positive during falling phase

99. A flood wave with a known inflow hydrograph is routed through a large uncontrolled reservoir. The outflow hydrograph will have

a) attenuated peak with reduced time base
b) attenuated peak with increase time base
c) increase peak with increase time base
d) increase peak with reduced time base

100. The Muskingum method of flood routing assumes the storage S is related to inflow rate I and outflow rate Q of a reach as S =
a) K[xI-(1-x)Q]
b) K[xQ+(1-x)I]
c) K[xI+(1-x)Q]
d) Kx[I-(1-x)Q]

101. A linear reservoir is one in which the
a) volume varies linearly with elevation
b) storage varies linearly with the outflow rate
c) storage varies linearly with time
d) storage varies linearly with the inflow rate

102. An isochrones is a line on the basin map
a) joining rainguage stations with equal rainfall duration
b) joining points having equal standard time
c) connecting points having equal time of travel of the surface runoff to the catchment outlet
d) that connects points having equal rainfall depth in a given time interval

103. A stream that provides water to the water table is termed
a) affluent
b) influent
c) ephemeral
d) effluent

104. Flowing artesian wells are expected in areas where
a) the water table is very close to the land surface
b) the aquifer is confined
c) the elevation of the piezometric head line is above the elevation of the ground surface
d) the rainfall is intense

105. The unit of intrinsic permeability is
a) cm/day
b) m/day
c) darcy/day
d) cm²

106. The specific storage is
a) storage coefficient/aquifer depth
b) specific yield per unit area
c) specific capacity per unit depth of aquifer
d) porosity-specific detention

107. In one-dimensional flow in a confined aquifer between two water bodies, the piezometric head line is
a) a straight line
b) a part of an ellipse
c) a parabola
d) an arc of a circle

108. The sediment delivery ratio (SDR) of a watershed is related to watershed area(A), relief (R) and watershed length (L) as
a) $SDR=KA^{m}(R/L)^{n}$
b) $SDR=KA^{-m}(R/L)^{-n}$
c) $SDR=KA^{-m}(R/L)^{n}$
d) $SDR=KA^{m}(R/L)^{-n}$

109. *The relation* between suspended sediment transport Q_s and stream flow Q is often represented by an equation of the form

$Q_s=KQ^n$

Where the exponent n usually lies in the range

a) *0.1 to 0.3*
b) *0.4 to 0.6*
c) *0.6 and 1.0*
d) 1.0 and 3.0

110. Make list-1 with list-2 and select the correct answer using the codes given below the lists:

List-1		*List-2*	
A	*Specific yield*	*1*	*Volume of water retained per volume of aquifer*
B	*Specific capacity*	*2*	*Volume of water drained by gravity per unit volume of aquifer*
C	*Specific retention*	*3*	*Difference of porosity and specific storage*
D	*Specific storage*	*4*	*Well yield per unit drawdown*
		5	*Volume of water released from unit volume of aquifer for unit decline in piezometric head*

Codes:

	A	*B*	*C*	*D*
(a)	***2***	***4***	***1***	***5***
(b)	*4*	*2*	*3*	*1*
(c)	*2*	*3*	*1*	*4*
(d)	*4*	*2*	*3*	*5*

111. *Match list-1* with list-2 and select the correct answer using the codes given below the lists:

List-1		*List-2*	
A	*Unit hydrograph*	*1*	*Design flood*
B	*Synthetic unit hydrograph*	*2*	*permeability*
C	*Darcy law*	*3*	*Ungauged basin*
D	*Rational method*	*4*	*1 cm of runoff*

Codes:

	A	*B*	*C*	D
(a)	*2*	*3*	*4*	*1*
(b)	***4***	***3***	***2***	***1***
(c)	*2*	*1*	*4*	*3*
(d)	*4*	*1*	*2*	*3*

112. The problem of soil erosion in cultivated areas occurs, when

a) soil is without cover
b) soil is slopy
c) soil under cover
d) soil under submergence

113. Scouring of soil particles from river/gully section during run-off flow is the phenomenon of

a) abrasion
b) attrition
c) solution
d) all above

114. Slope length effects the erosion mainly by

a) increasing the flow velocity for shorter duration
b) decreasing flow velocity for shorter duration
c) increasing flow velocity for longer duration
d) increasing deposition

115. Maximum movement of soil particles takes place, when flow depth is

a) about or equal to particles diameters
b) less than 15 mm
c) more than 5cm
d) equal to 10 cm

116. Detachment and transportation of soil particle is greater in

a) splash erosion

b) rill erosion
c) sheet erosion
d) both b & c

117. Sheet erosion is also termed as
a) attrition
b) laminar erosion
c) detritions
d) photogenic erosion

118. An erosion with intensity greater than 200 m^3/ha/y is said to be
a) very severe
b) catastrophic erosion
c) geological erosion
d) moderate erosion

119. The ratio of sediment yield to the gross soil loss from a watershed is called as
a) sediment delivery ratio
b) erosion intensity
c) erosion index
d) critical soil loss

120. A greater soil erosion is observed in case of
a) soil surface covered by plant canopy
b) soil surface under grass cover
c) soil under forest cover
d) soil under cultivated crop

121. In the geological formation, where surface and sub surface soils are easily erodible,
a) V-shaped gullies are formed
b) U-shaped gullies are formed
c) Rectangular gullies are formed
d) Parabolic gullies are formed

122. Small gullies have the dimension of
a) depth 3m and bed width more than 18m
b) depth more than 18 m and bed width less than 3 m
c) bed width 5m and depth 10 m
d) none of above

123. Critical velocity of water flow to cause washing of soil particles for sand formations of all grain sizes is
a) 0.3 to 0.55 m/s
b) 0.6 m/s
c) 1.0 to 2 m/s
d) 0.7 to 1.5 m/s

124. To check the gully from scouring backward, the gradient of gully head should be reduced upto the angle of
a) 15°
b) 20°
c) 30°
d) 45°

125. For gully control using check dams the apron length for gully bed slope upto 8.5°, should be equal to
a) 1.50 m
b) 1.5 times the dam height
c) 2.0 m
d) 10 m

126. In masonry rubble dam for gully control the base thickness should be
a) 3/4 of the dam height
b) more than 3/4 of the dam height
c) 15 cm
d) less than 3/4 of the dam height

127. Design of permanent gully control structures is performed for the return periods of
a) 25 to 30 years
b) 15 years
c) 50 to 100 years
d) 10 years

128. In design of outlet section of straight drop structure, the height of floor blocks should be equal to
a) 0.8 d_c
b) 0.5 d_c
c) 0.25 d_c
d) 1.15 d_c

129. Lower portions of perennial streams are mainly associated to the problems of
a) undermining
b) scouring of soil particles
c) washing of soil particles
d) all above

130. Spurs should be extended towards stream at an angle of
- **a) 45°**
- b) 30°
- c) 15°
- d) 10°

131. The main cause of torrent erosion is
- **a) high velocity water flow**
- b) low velocity water flow
- c) wave action
- d) swift current only

132. Stream bank erosion will be greater, when flow is
- **a) turbulent**
- b) laminar
- c) critical
- d) uniform

133. Formation of sand dune is associated to
- a) water erosion
- **b) wind erosion**
- c) gully erosion
- d) stream bank erosion

134. Friction velocity of blowing wind is measured at the height
- a) of 15 m
- **b) where shear stress begins to cause soil erosion**
- c) of 7.5 m
- d) of 10 m

135. The most vulnerable range of particles to get movement under saltation process is
- **a) 0.1 to 0.15 mm diameter**
- b) 0.05 to 0.5 mm diameter
- c) 1 to 2 mm diameter
- d) 2 to 5 mm diameter

136. Wind turbulence is greater on
- **a) rough surface**
- b) smooth surface
- c) slopy surface
- d) level surface

137. The range of particles size, which are very high erodible due to wind, is
- **a) 0.1 to 0.15 mm diameter**
- b) 0.05 to 0.1 mm diameter
- c) 1 to 1.5 mm diameter
- d) 2 to 3 mm diameter

138. Highest possible wind erosion from an unprotected soil is called as
- **a) potential wind erosion**
- b) normal wind erosion
- c) rated wind erosion
- d) none of above

139. Shelterbelts are composed of
- a) one row of vegetative materials, only
- **b) more than two rows of vegetative materials, only**
- c) two rows of non-vegetative materials only
- d) one row of non-vegetative materials, only

140. A shelterbelt creates effect on wind velocity towards wind ward side upto a distance of
- **a) 5 times the average height of shelterbelt**
- b) 5 times the height of tallest tree
- c) 2 to 3 times the field length
- d) 10 times row spacing

141. Threshold velocity of wind at 15 m height is generally taken as
- a) 23 kmph
- **b) 34 kmph**
- c) 15 kmph
- d) 10 kmph

142. Erodibility is associated to
- **a) soil properties**
- b) wind properties
- c) rainfall characteristics
- d) watershed characteristics (physical)

143. Kinetic energy (K.E) and rainfall intensity are related by the relationship as
- **a) $KE = 210.3 + 89 \log_{10} I$**
- b) $KE = a I^{(b+c)}$
- c) $KE = a e^{I}$
- d) $KE = a e^{I+\log t}$

144. KE > 25 index method for computing rainfall erosivity factor (R), does not consider the rainfall of intensity
a) more than 25 mm/h
b) less than 25 mm/h
c) 25 mm/h
d) 30 mm/h

145. I_{30} index method computes the rainfall erosivity factor based on
a) rainfall intensity
b) rainfall depth
c) rainfall duration
d) run- off depth

146. General form of relationship between rainfall erosivity *(EI_{30})* and rainfall depth (P) is
a) $EI_{30} = a\ P^b$
b) $EI_{30} = a + b\ log\ P$
c) $EI_{30} = I\ exp\ (P)$
d) $EI_{30} = a + bP$

147. A system under which lands are classified as per their potential-ability to produce the yield is called as
a) LUCC
b) soil classification
c) land grouping
d) none of above

148. The land characteristics that can be remove by land management practices are referred as
a) permanent limitations
b) sub-permanent limitations
c) temporary limitations
d) none of above

149. Under LUCC, the lands under class-1 to IV are
a) suitable for cultivation
b) not suitable for cultivation
c) suitable for wild life conservation
d) unsuitable for forestory

150. Class-II lands of LUCC are
a) very good
b) good but have some moderate natural-use limitation
c) very good without limitation
d) none of above

151. In LUCC system, the sub-class indicates the problem of
a) erosion and run-off
b) wetness and drainage
c) shallow soil depth
d) climatic limitation

152. Land use sub-class (S) indicates the lands under the problem of
a) shallow soil depth, stoniness, droughty and salinity i.e. root zone limitation
b) erosion and run-off
c) wetness and drainage
d) climatic limitation

153. Agronomical measures to control soil erosion, are
a) contour cultivation, strip cropping
b) bunding and terracing
c) wind break and shelter belt
d) check dams and spurs

154. On a long and gentle slope, the first contour line is generally fixed at
a) about 50 m apart from the hill top
b) about 50 m apart from bottom of hill
c) 100 m interval
d) 150 m interval

155. Amongst following, the most effective measure for moisture conservation, is
a) strip cropping
b) buffer strip cropping
c) contouring
d) bench terracing

156. Width of wind strip crops is kept maximum in
a) clay loam soil
b) sandy soil
c) sandy loam soil
d) clay soil

157. A mulch layer facilitates the development of
a) macro pores in the soil

b) micro pores in the soil
c) soil erosion problem
d) soil loss problem

158. The agronomical practices for soil conservation are considered as
a) first line of defence
b) second line of defence
c) substitute of mechanical measures
d) none of above

159. Soil loss will be minimum in the field under
a) strip ploughing
b) normal ploughing
c) zero tillage
d) minimum tillage

160. The strip cropping becomes most effective to control soil loss from a field, where it is followed alongwith
a) crop rotation
b) grassed waterway
c) a poor cropping intensity
d) none of above

161. Bunds constructed on contour of the area are called as
a) graded bunds
b) level bunds
c) contour bunds
d) uniform bunds

162. Graded bunds are constructed in the areas of
a) high rainfall
b) low rainfall
c) medium to high rainfall
d) medium rainfall

163. The minimum permissible grade to be given in a graded bund is equal to
a) 0.5%
b) 0.1%
c) 1%
d) 5%

164. 'Cox formula' is associated to compute
a) run-off depth
b) effective rainfall
c) VI of bund
d) soil loss

165. The length of bund to be constructed in an area depends on
a) horizontal interval
b) vertical interval
c) bottom width of bund
d) all above

166. The cross-sectional area of side bund and lateral bund is kept same as
a) main bund
b) marginal bund
c) *30%* of main bund
d) Shoulder bund

167. The capacity of channel of graded bund in erosion resisting soil is determined based on flow velocity
a) less than 0.50 m/s
b) less than 0.65 m/s
c) 1.5 m/s
d) from 1 to 3 m/s

168. The design of contour trench is performed based on the return period of
a) 10 to 15 years
b) 5 to 10 years
c) 20 to 25 years
d) 30 years

169. The mechanical measures to control soil loss are associated to
a) land management
b) watershed management
c) water management
d) water harvesting

170. A maximum soil loss per mm of run-off will be greater in
a) up and down the slope farming practices
b) channel terrace with graded furrows
c) bench terraced land
d) strip cropped land

171. Terracing to control soil loss is used on
a) highly sloped land
b) medium sloped land

c) flat land
d) none of above

172. The width of broad base terraces is approximately taken as
a) 5 m
b) 10 m
c) 15 m
d) 25 m

173. The slope of bench in case of level bench terrace is kept
a) about 1%
b) 10%
c) 5%
d) 7.5%

174. The provision of shoulder bund is essential in case of
a) level bench terrace
b) bench terrace sloping inward
c) bench terrace sloping outward
d) both b & c

175. Bench terraces sloping inward are also called as
a) hill type bench terraces
b) level bench terraces
c) paddy bench terraces
d) orchard type bench terraces

176. Terrace spacing is generally kept as
a) double of depth of cut
b) top width
c) half of top width
d) none of above

177. The formula for computation of earthwork incase of level bench terrace is given by
a) EW=1250 VI
b) EW= $1250\ W/_{VI}$
c) EW= $1250\ VI/_{W}$
d) EW= $1250\ W/_{100+S}$

178. The most economical shape of grassed waterway is
a) Trapezoidal
b) Triangular
c) Parabolic
d) Rectangular

179. The most preferred grass variety for construction of grassed water way is
a) Bunch grass
b) Dub grass
c) Rhizomatous grass
d) Both b and c

180. In watershed, if natural drains are available then they are preferably used as grassed waterway because
a) They have good grade
b) Their capacity is more
c) There is minimum earthwork
d) All of the above

181. Maximum rate of soil loss that can occur and still permit sustained crop production is called as
a) Ultimate soil loss rate
b) Soil loss tolerance
c) Permissible soil loss
d) None of the above

182. In USLE/RUSLE, the relation between soil loss and factor-R is
a) linear
b) exponential
c) power form
d) logarithmic

183. The factor L and S in combine form is called as
a) Topographic factor
b) Slope steepness factor
c) Geologic factor
d) Normal factor

184. Terminal velocity of raindrop is the function of
a) shape of drop
b) drop height
c) drop size
d) all of the above

185. In North-Eastern part of india, the problem of severe soil erosion is mainly due to
a) forestation

b) mining
c) forest burning
d) shifting cultivation

186. On steep sloping lands, intensive farming is possible only with
a) Contour cultivation
b) Strip cropping
c) Bench terracing
d) Bunding

187. Grazing incidence is known as
a) Grazing intensity
b) Over grazing
c) Grassland degradation
d) Grassland destruction

188. Importance of harvested water is greater
a) in arid and semi-arid regions
b) in humid regions
c) at the places where construction of water structure is very costly
d) Both a and b

189. The graded bunds constructed for water harvesting are suitable for the land slope

a) 3% b) 1.5 %

c) from 0.5 to 2 % d) 10%

190. For water harvesting, the high level bunds are constructed at

a) gully head

b) depressed part of watershed

c) either sides of gully

d) none of the above

191. The water source for off-stream storage pond is

a) perennial rivers

b) ephemeral rivers

c) intermittent rivers

d) all above

192. The core wall is constructed by using

a) pervious materials

b) impervious materials

c) RCC

d) all above

193. For a farm pond with catchment area less than 4 ha, the most suitable spillway to use is

a) Vegetative type

b) permanent

c) straight drop spillway

d) chute spillway

194. The most common and convenient shape for dug out pond is

a) Triangular

b) Parabolic

c) Trapezoidal

d) Circular

195. The side of dam where water is stored to form a pool of water is called as

a) protected zone

b) d/s

c) u/s

d) none of the above

196. A diaphragm type earth dam is the modified form of

a) Rock fill dam

b) homogeneous type dam

c) gravity dam

d) retaining wall

197. Insufficient freeboard and higher settlement in earth dam cause the failure due to

a) sloughing

b) wave action

c) overtopping

d) all above

198. The phreatic line in an earth dam is also called as

a) saturation line

b) equipotential line

c) seepage line

d) stream line

199. A wall used to support the load of bridge or culvert and also to retain the earth simultaneously , is called as

a) pier

b) Retaining wall

c) aboutment

d) pillar

200. To make the cantilever type retaining wall safe against sliding, key is provided at its

a) base

b) heel

c) stem

d) top